

BEDSIDE MEDICINE FOR BEDSIDE DOCTORS

An Open Forum for brief discussions of the workaday problems of the bedside doctor. Suggestions of subjects for discussions invited.

HEADACHES

I. ETIOLOGY

J. M. NIELSEN, M.D. (727 West Seventh Street, Los Angeles).—The term "headache" is not well defined. Most patients distinguish between headache and a pain in the head, the former being as a rule a duller sensation, the latter rather a sharp pain; yet a neuralgic headache is a common clinical complaint. Some patients consider a headache a pain arising within the cranial cavity, yet migraine headaches frequently extend "down the neck and into the shoulder." The so-called indurative headaches are due, not to an intracranial condition, but to fibromyositis at the sites of insertion of the neck muscles into the base of the skull. We are, therefore, forced to take a broad view and discuss in the etiology of headache those conditions which cause discomfort about the head, commonly complained of as headache.

Headaches due to many causes, until recently obscure, have been clarified by the work of Kennedy on angioneurotic edema of the brain,¹ of Forbes and Wolff,² Cobb and Finesinger,³ Chorobski and Penfield,⁴ and Finesinger,⁵ on anatomy, physiology, and pharmacology of the cerebral circulation. There is no longer any question that vasomotor nerves play a great part in cerebral circulatory adjustments. That such circulatory changes, when marked or extreme, may cause headache, is admitted.

All headaches may be considered due to one or more of the four following pathological states, or to an unknown cause:

- I. Change in intracranial pressure.
- II. Pathological anatomy or physiology essentially extracranial but causing headache reflexly.
- III. Toxemia.
- IV. Meningeal irritation aside from expansion.
- V. Unknown. Here we are still forced to include many cases of migraine.

I. CHANGE IN INTRACRANIAL PRESSURE:

1. Increase in Intracranial Pressure.

(a) Obstruction of venous circulation. Thrombosis of cerebral sinuses, or of cerebral veins; presence of venous aneurysms, polycythemia vera.

¹ Kennedy, F.: Cerebral Symptoms Induced by Angioneurotic Edema, Arch. Neurol. and Psychiat., 15:28-33 (Jan.), 1926. Reported three cases before the Amer. Neurol. Soc., Washington, May, 1925.

² Forbes, H. S. and Wolff, H. G.: Cerebral Circulation—The Vasomotor Control of Cerebral Vessels, Arch. Neurol. and Psychiat., 19:1057-1086 (June), 1928.

³ Cobb, S. and Finesinger, J. E.: Cerebral Circulation—The Vagal Pathway of the Vasodilator Impulses, Arch. Neurol. and Psychiat., 28:1243-1256 (Dec.), 1932.

⁴ Chorobski, J. and Penfield, W.: Cerebral Vasodilator Nerves and their Pathway from the Medulla Oblongata, Arch. Neurol. and Psychiat., 28:1257-1289 (Dec.), 1932.

⁵ Finesinger, J. E.: Cerebral Circulation—Effect of Caffeine on Cerebral Blood Vessels, Arch. Neurol. and Psychiat., 28:1290-1325 (Dec.), 1932.

(b) Increased blood supply through the arteries by dilatation; reflex because of medullary anemia, as in acute head injuries; some cases of migraine, many functional states, particularly psychoneuroses.

(c) Stasis in cerebral blood vessels, as in lowering of the head, in inversion of the body, or jugular ligation.

(d) Obstruction of cerebrospinal fluid circulation causing hydrocephalus. (1) Lesions at foramina of Monro; blood-clot, tumor of the third ventricle, and aneurysm. (2) Lesions within the third ventricle: tumor or blood-clot. (3) Lesions at the midbrain. Tumor of the pineal body, corpora quadrigemina, or immediate vicinity. Obstruction of the aqueduct by blood-clot or by chronic meningitis or ependymitis, syringobulbia during stage of gliosis. (4) Lesions at the fourth ventricle. Obstruction of the foramina of Luschka, or foramen of Magendie, by fourth ventricle tumors especially in children, other cerebellar tumors, tumor or abscess of the cerebellopontine angle, chronic leptomeningitis whether non-specific or due to tuberculosis, syphilis, coccidioidal or other chronic granuloma, torula, or the common epidemic organism. It may result from arachnoiditis, following intraventricular hemorrhage. (5) Lesions at the base causing "communicating hydrocephalus."

(e) Increase in size of cranial contents aside from those caused by increase in blood or spinal fluid. (1) All tumors which do not actually replace brain tissue. (2) Brain abscesses of all types and sources. (3) Localized hemorrhages, especially subdural hemorrhages. (In infancy this may give rise to external hydrocephalus.) (4) Non-purulent inflammatory conditions of the brain. Encephalitis preliminary to abscess or of the epidemic type, or encephalitis secondary to vaccination, measles, mumps, scarlet fever, or due to lues, tuberculosis, parasitic infection, otitis media, or in fact secondary to any acute infectious disease. (5) Edema as in uremia, acute head injury, serum reactions, angioneurotic or urticarial edema. The various generalized infectious diseases may cause edema of the brain, as may acute intoxications of which that due to alcohol is an example. Allergic sensitization may cause edema. Certain edemas are of unknown origin, such as that of epilepsy. (6) Increased pressure, secondary to acute increase in blood pressure, fear, anxiety, worry, and mental depression. Chronic hypertension is also frequently associated with headache.

2. Decrease in Intracranial Pressure.

(a) Arachnoidal tears within the spinal canal, as from trauma or dural incision from a spinal puncture, with continual drainage. Headache oc-

curs during withdrawal of fluid, in preparation for a ventriculography or encephalography.

(b) Shock (the decrease in pressure being due to accumulation of blood in the splanchnic area), sudden hemorrhage, syncope, and certain emotional states.

(c) Arterial spasm (position in outline doubtful).

II. EXTRACRANIAL PATHOLOGICAL ANATOMY AND PHYSIOLOGY, CAUSING REFLEX PAINS:

(a) *About the eyes.* (1) Errors of refraction. (2) Excessive use of eyes. (3) Attempts to focus on moving objects. (4) Alternating strabismus. (5) Excessive or insufficient convergence. (6) Muscle imbalance.

(b) *About the ears.* (1) Otitis media. (2) Mastoiditis. (3) Wax impaction. (4) Foreign bodies in canals. (5) Infectious sinus thrombosis.

(c) *About the nose and mouth.* (1) Septal contact. (2) Turgescence of the turbinates. (3) Ethmoiditis. (4) Sphenoiditis. (This gives a characteristic headache over and above the ears, and toward the mastoid region.) (5) Maxillary sinusitis. (6) Frontal sinusitis. (7) Foreign body. (8) Infected teeth. (9) Impacted teeth.

(d) *About the throat.* (1) Nasopharyngitis. (2) Eustachian salpingitis. (3) Retropharyngeal abscess. (4) Glossopharyngeal neuralgia. (5) Infected or impacted teeth.

(e) *About the cranium and scalp.* (1) Osteomyelitis of the skull. (2) Osteitis; luetic, tuberculous, osteitis deformans, leontiasis ossea. (3) Periostitis. (4) Fibromyositis about the insertions of muscles at the base of the skull—indurative headache. (5) Occipital nerve neuralgia or neuritis—not true headache. (6) Supra-orbital neuralgia—not true headache. (7) Malignant metastasis to the cranium and scalp.

(f) *Distant organs.* (1) Distended rectum. (2) Ovarian disease. (3) Hepatitis. (4) Enteritis. (5) Also practically any visceral infection may cause headache in certain persons. (6) Certain states of some organs not constituting disease. For example, in some cases hunger alone is sufficient.

III. TOXEMIA CAUSING HEADACHE:

1. *Acute Toxemias.*—Almost any acute toxemia. This includes acute infectious diseases, intoxication with drugs, chemicals, fumes, etc. Worthy of special mention are: alcohol, tobacco, mercury, lead, arsenic, many sedative drugs (especially of the barbituric compounds), carbon monoxid, many fumes as hydrocyanic acid, chlorine, sulphur dioxide, carbon disulphid. There are many others. Of acute exogenous bacterial exotoxins tetanus, diphtheria and botulism are important. Food poisoning is worthy of mention.

2. *Chronic Toxemias.*—Intestinal toxemia (nature unknown), exposure to toxins or fumes in occupations.

IV. MENINGEAL IRRITATION:

(To list all causes of meningeal irritation would be to repeat many of the causes mentioned above

which operate through this channel.) The most pertinent causes are: Meningitis of all kinds (remember syphilis), meningeal irritation without an actual meningitis; especially to be remembered is that due to brain abscess, sinusitis, pneumonia, typhoid fever, and other acute infectious diseases, and to blood in the subarachnoid space.

V. UNKNOWN:

Space does not permit an analysis of the subject of migraine. Psychic, emotional, endocrine, chemical, physical, and pharmacologic factors all play a rôle.

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II. OCULAR CAUSES OF HEAD PAINS

RODERIC O'CONNOR, M. D. (450 Sutter Street, San Francisco).—It is the common belief among the general public, and not very uncommon among medical men that if headaches and other symptoms of eyestrain are not relieved by glasses nothing further can be done. It is only in this way that we can excuse the frequency with which patients are referred by them to non-medical examiners for ocular examination. In doing so, such practitioners apparently forget that an examination of the ocular apparatus is as much a medical affair as one of the heart or lungs. The percentage of headaches due to ocular disturbances is difficult to determine, but probably seventy is a fair estimate. It is evident that the frequency with which the eyes are proved to be the cause will depend on the completeness of the ocular examination, the correct interpretation of findings and the proper carrying out of the right treatment.

Many patients show nothing wrong by ordinary tests, and yet there is definite eye disability. Most of these, by more detailed study employing prolonged monocular occlusion, turn out to be cases of hidden imbalance of the extra-ocular muscles. Some are of mild or beginning glaucoma. The importance of always having in mind the possibility of glaucoma cannot be overemphasized. The frequency with which eyes are blinded by this disease is a sufficient reason, in itself, to serve as a cause for prohibiting the examination of eyes by non-medical individuals. Many eye headaches are typically migraine, as far as the symptoms are concerned. The fact that it may be hereditary has no diagnostic significance, as ocular defects are even oftener so. Neither does vomiting indicate true migraine, as nausea, with vomiting, is a rather common symptom of certain forms of eye trouble. I have frequently seen the scintillating scotoma of migraine (supposedly) disappear after relief of eyestrain.

Most patients are able definitely to relate their headaches to overwork of the eyes; others cannot but state that it is present all day except on waking. Early morning headaches are more often nasal in origin. Women complain of shopping headaches. Many have them on cars or automobiles, or under other conditions where the eyes must follow moving objects. These are usually found to have disturbances of the ocular muscles, the compensation for which is especially difficult when the eyes are in motion.

While the consideration of intracranial pressure is out of place, it must be remembered that its diagnosis is often first made by the ophthalmologist while investigating headache. To show the harm done by non-medical eye care, I can state that I have seen three patients with brain tumor, all of whom lost their chance for life because of the delay incidental to the trying of many pairs of lenses, muscle exercises, or both, by non-medical examiners.

Pains in the base of the skull and upper cervical region are frequently of ocular origin, the causes usually being those conditions that call for a change in the position of the head to compensate, such as oblique astigmatism, vertical deviations, cyclophoria and the various forms of paralysis of the ocular muscles.

It should be concluded, therefore, (1) that the ocular apparatus must be completely studied in all cases of headache where the cause is not very evident. Frequently women come for eye examination after much gynecologic surgery, when the cause is quite easily located in the eyes. I never cease to wonder at the common failure of general men to check over first the seat of the pain. (2) That no physician should allow his treatment of a patient with headache to be influenced by the failure of an ordinary refraction to locate its cause. Refraction is but the beginning of a complete examination.

CLASSIFICATION OF CAUSES

- A. Refractive errors.
- B. Extra-ocular muscle imbalances.
- C. Pupillary asthenopia—glare.
- D. Increased intra-ocular pressure.
- E. Inflammatory conditions.

A. Refractive errors are well-known causes, so therefore only a few points will be considered.

1. Hyperopia is the commonest cause because the focusing apparatus is at work all the time the eyes are open.

2. Myopia seldom, in itself, causes headache, because the eyes are at rest for distance and have less to do for near. Very low degrees may cause trouble, because the accommodation is constantly trying to clear up the blur, but without success. Headaches in myopes are more often due to accompanying muscle deviations.

3. Astigmatism. The oblique forms are especially important as objects are twisted; which is compensated by action of the oblique muscles to rotate the eye about its anteroposterior axis, or by head tilting, or by both. In certain cases of very high astigmatism, the optical disadvantages of such strong cylinders are so great that they cannot be worn. In some of these, operative measures on the cornea to reduce or neutralize the astigmatism are worth while. In one instance, I reduced a nine-diopter astigmatism to two by a thorough cautery of the cornea. The corrected vision improved from 20/100 to 20/30, and headaches stopped at once. This correction was maintained, at last examination, nine years after the operation.

4. Anisometropia is the condition in which the eyes differ so much in refraction that satisfactory binocular vision with the lenses is often impossible. Occasionally, as mentioned under the preceding heading, the difference may be reduced to bearable limits. Rarely we see what appears to be an impossible situation. One such in my experience was emmetropic in one eye, and 24 diopter myopia in the other, and for some reason had severe headaches. I extracted the lens from the myopic eye by needling, which reduced its refraction to 4D and again for some reason, the headaches stopped. Her corrected vision improved from 20/70 to 20/30.

5. Presbyopia at its onset is often accompanied by severe headaches because of the added difficulty of accommodation. This is due to the extra ciliary effort needed to make the necessary change in the focus of the lens.

B. Disturbances of the extra-ocular muscles. Leaving out of consideration cases of actual strabismus, which does *not* cause headache, and paralysis, we have the following conditions:

1. Esophoria, where the visual axes tend to converge and the corrective effort falls on the divergers. When of any amount the strain is severe because normally there is no need for those muscles to work except as rotators.

2. Exophoria, when the visual axes tend to diverge, calling for correction by the convergers. A greater degree of exophoria can be borne because the convergers can stand the strain of correction.

3. Cyclophoria, when the vertical axes tilt in or out. The correction must be made by the oblique muscles which often results in severe symptoms.

4. Hyperphoria, when one visual line is higher than the other. This condition causes symptoms out of all proportion because, in its correction, an entirely abnormal action of the vertical rotators must be made. Normally, both eyes look up or down equally; but here one must turn up while the other turns down, to bring both to the same level. I have seen instances of marked disability from one degree of disalignment. Luckily, prism corrections are borne better in moderate degrees. Vertical deviations often cause head-tilt in order to bring the eyes to a level and so save the ocular muscles. This tilt carries the shoulder down, which, in turn, means a spinal curvature. And all in a purely mechanical way. A complete eye examination in such conditions might be of great help to the orthopedist at times. Another common sign is an elevation of one eyebrow through an associated action of the frontalis in the effort to hold up the lower eye.

In the above-named conditions, the corrective strain is present as long as the eyes are open, even though not in use for near; which means that relief can be secured only by closing one or both eyes. The monocular occlusion test comes into play here in the diagnosis of the cause of symptoms.

5. Insufficiency of convergence when the visual axes cannot be converged close enough to permit continued use of the eyes for near. It has been proved that the eyes must converge easily to at

least four inches from centers to permit prolonged work at thirteen inches. In other words, two-thirds of the total power must be in reserve. In this connection the patient's occupation must be considered, for, even though he may have a normal test, he may have trouble if his work is done closer than thirteen inches. Frequently the muscle balance of these eyes is normal for distance, and in those the symptoms are related only to the near use of them.

C. Pupillary asthenopia is due to overwork of the pupilloconstrictor mechanism by excessive glare. At times it results from excessive artificial illumination when there is direct exposure. Photophobia occurring under ordinary conditions often disappears when errors in refraction and muscle balance are corrected. Therefore, tinted lenses are not in order, simply because the patient may complain of sensitiveness to light. The real cause must be searched for. Normally the pupils contract with accommodation and convergence. An undue contraction from glare may throw this associated action out of balance. Many office workers are sufferers from this trouble, and their stories of the refusal of employers to do anything to help are often almost unbelievable. In an Oakland laundry all the desk workers face the prevailing south sunlight; yet the proprietor has consistently refused to make a change because it would disturb the telephone wires!!

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III. HEADACHES OF NASAL ORIGIN

JOSEPH GOLDSTEIN, M.D. (945 Roosevelt Building, Los Angeles).—To the average layman any discomfort in the head is a headache. He recognizes only various intensities of the ache; if severe, he calls it pain. Constitutional diseases causing meningeal edema, ocular fatigue, pains from nasal origin, etc., all produce headaches.

Probably 50 per cent or more of all headaches in individuals under fifty years of age are the result of pathologic changes in the nose and accessory sinuses.

A brief description of the anatomy of the nose and these accessory sinuses, and their relationship to other structures of the head, is indicated. The two nares are separated by a firm septal partition. The lateral bony walls do not yield to ordinary pressure. The accessory sinuses empty into each naris through small ostia. The sinuses are normally separated from adjacent organs by bony walls. Some cells are found practically all around the orbit, in front and below the brain, and over the upper teeth. Any disease of one of these sinuses can produce pain and pathologic processes to any of the adjacent structures.

The mucosa of the nose contains mucus-secreting cells supported by loose areolar tissue. Such tissues swell readily if infected, or more often because of allergic manifestations. When any part or all the nose is filled by this hypertrophied tissue, producing pressure, we have headache or, if severe, pain.

Infections of the various sinuses produce, as a rule, typical pains. A frontal sinus headache comes on early in the morning and wears off during the day; and this is located just above the orbit. These patients frequently complain of asthenopia. Sphenoid disease usually produces pain in the lower half of the head, and is generally present in the afternoon. Ethmoidal disease is referred to the top of the head. Antral disease causes unilateral pain, and may be referred to the ear or behind the ear.

The most important ganglion of the nose is the sphenopalatine, lying just under the mucous membrane behind and above the posterior attachment of the middle turbinate. The posterior ethmoids and sphenoid, when diseased, frequently irritate this ganglion. Because of their many associating paths, pain and irritation are often referred to the eye, to the ear, or even down the neck, and into the shoulder.

Headache of nasal origin may follow (1) acute, (2) subacute, or (3) chronic pathologic processes within the nose and accessory sinuses.

1. *Acute*.—The common cold produces an acute edema of the mucous membrane, with secondary purulent drainage from the sinuses. Headache is the result of pressure of the engorged turbinates against unyielding structures, and by pressure of fluid in the sinuses, which cannot drain properly because of closed ostia.

2. *Subacute*.—Due to repeated or prolonged infections in noses which drain poorly, one or more sinuses may remain infected. This is frequently the result of a thick or badly deviated septum; or from hyperplastic or cystic turbinates. The mucosa of the sinus and the underlying tissue, including the basement membrane, are secondarily invaded by various microorganisms, usually streptococci, and we find, by antro-puncture, mucus in the cavity. Headaches result from (a) absorption, (b) inflammation of the sphenopalatine ganglion, or (c) by extension to the surrounding organs.

3. *Chronic*.—Chronic nasal pathology, when not due to anomalies of the bony structures of the nose, are usually allergic. This is the leading cause of headache of nasal origin. The headaches are bizarre in type, frequently referred to the root of the nose, to the eyes, to the ears, the lower half of the head, or when once starting, then irritation of the sphenopalatine ganglion may have pain referred even into the neck and shoulder.

So far, our results in treating allergic diseases of the nose have not been altogether gratifying. There is still much to be done in this field. Frequently, changes in climate or environment are our only means of aiding the patient. At times, our allergists have been able to help them.

In conclusion, headaches of nasal origin are more common than suspected; caused by poorly draining sinuses and by pressure from within the nose against bony abutments and produced by acute, subacute, and chronic nasal pathology.

IV. DIAGNOSIS AND TREATMENT

FRED H. KRUSE, M. D. (384 Post Street, San Francisco).—An adequate discussion of the diagnosis and treatment of headaches is a large subject. Volumes could be and have been written on classification, differentiation, and the suggested forms of treatment. Even when in agreement as to group names for different kinds of headaches, there is such a wide divergence of opinion as to specific causes in certain groups that therapy often becomes both conflicting and confusing.

The important thing is to recognize that any headache is a symptom, and even as a symptom does not too regularly fall into the usual symptom complexes or syndromes easy of recognition. Frequently the surface indications, as expressed by the patient, are misleading, and the real story has to be patiently elicited. In fact, headaches as a group have the embarrassing distinction of all appearing very much alike on the surface; and frequently it is only by the most careful analysis of the anamnesis that they can be fitted into a distinguishable category.

It is true that the migrainous, neurotic and asthenic types, the circulatory and increased intracranial pressure group, as well as the toxic and infectious groups, present common characteristics often readily recognizable. However, there are a host of disturbances simulating any or all of these, and even queer variations within certain groups, especially in their inception, which may lead us astray from the real underlying etiologic factors.

Often the practitioner, occupied with many disorders, is too busy at the time for thorough investigation. It is easier to prescribe a sedative. The patient with frequently recurring headaches then moves on in his search for someone who will determine the cause of his trouble. For the more recent headaches with acute onsets, a quick survey, including an inspection of nose and throat, temperature, blood count and blood pressure, is sufficient to determine whether a hypertension, an acute sinus, respiratory infection, or other infectious disease is present, or if the trouble is of sudden nervous origin. It is with the persistent headache and the more chronic recurring types that we have our troubles.

These patients should be brought back for a careful study. Both Barber and Robey, in discussing such cases, lay great stress upon a careful medical history. Unless we can immediately demonstrate a brain tumor, a hypertension, a sinus with bad drainage, or an infectious disease, our search will probably take us far afield into family history, home environment, living and dietary habits, allergic disturbances, endocrine dyscrasias and complicated digestive, metabolic and food disorders. It is better to try to get all the story at once, instead of piecemeal on occasional visits. It is also well to listen to and record carefully the spontaneous statements of the patient, and then, by skillful questioning, ascertain the character, frequency, duration, intensity, site and radiation of the ache or pain in the head. This should be amplified by finding out how and when the head-

aches first began and of their progress and change since.

Heredity is important especially in relation to such diseases as syphilis, hypertension and migraine, and hence a careful family history must be taken. The past history and review of previous diseases and environmental situations are important. Finally, we must not forget how difficult it is for many people accurately to describe what they feel or have felt. Many people fail to discriminate among their sensations, and it is only by careful inquiry that we can determine whether they have a violent pain, a dull ache, a feeling like a tight band about the head, or cap or hat pressure in the head. Location as to vertex, frontal region, occiput, or neck and back of the head pain, with radiation and drawing of the upper back muscles, is necessary for diagnosis.

As for the rest of the examination, I know of no more admirable summary than that of Lewellyn F. Barker given before a clinic to physicians in 1928:

"Important as is the analysis of the patient's subjective complaints, the objective examination of the patient suffering from headache, is no less momentous. This objective study should be pushed far enough to differentiate among the various possible causes of the headache. It should, of course, include a careful general physical examination, during which the blood pressure should be determined and the eye grounds examined. In how far laboratory tests, x-ray tests, and examinations by specialists shall be applied in a given case must be left to the training, experience and common sense of the examiner. Superfluous tests should be avoided; indispensable tests should never be omitted."

The following group will include practically all kinds of headache, and is of convenience in considering diagnosis and treatment:

1. Headaches of infectious origin.
2. Headaches of toxic origin.
3. Headaches of cardiovascular renal disease.
4. Headaches due to disorders of special senses: eye, nose, etc.
5. Headaches due to organic diseases of brain and skull and other head structures.
6. Migraine.
7. Headaches due to functional disturbances of the nervous and digestive systems.
8. Endocrine headaches.

Of the above, the infectious migraine, and the various functional disorders of the nervous and digestive systems, often with an associated asthenia, and undernutrition, will constitute at least 90 per cent of all the headaches with which the general physician has to deal.

1. *Headaches of Infectious Origin.*

Almost any infectious disease and many focal infections will produce headache. The history, clinical findings, presence of fever and variations from normal in the blood count will determine whether home supervision or hospitalization, with other laboratory investigation such as blood cultures, agglutination tests, lumbar puncture, x-rays, etc., will be necessary. The enteric fevers, men-

ingitis, poliomyelitis, trachiniasis, influenza, epidemic encephalitis, malaria, pneumonias and acute sinus infection, cause the most severe and often, at first, the most baffling types. The treatment, of course, is symptomatic and that of the disease itself.

Syphilis is a frequent cause of headache. The importance of the recognition of the headache of syphilis on account of the advantage of prompt treatment, which may save the patient from paralysis and mental breakdown, cannot be overestimated. Intensity, persistence and nocturnal exacerbations characterize the headache. The pain has been likened to a weight on the head, sometimes to compression of the head in a vise, and at other times to blows on the head with a hammer.

I had a patient recently with syphilis who talked of throbbing and pounding in her head. It was especially bad at night, and a phonograph in a neighboring apartment would seem to start and exacerbate the beating. The intensity and long duration of the headaches are of great importance in diagnosis. Attacks sometimes occur for several years before the supervention of further cerebral trouble. Periostitis and nerve pressure may give rise to headache in syphilis, also meningitis and syphilitic arteritis, which are more apt to cause the typical headache described above. In meningitis and syphilitic arteritis, the headache is diffuse, intense, persistent, and worse at night. In the secondary stage of the disease, the headache may be in active association with the eruption. It is apt to be occipital, and to increase in intensity toward night. It may go over the entire head, or it may be limited to one side of the occiput. Periosteal swellings are found chiefly on the frontal and parietal bones, and there is not only a lot of head pain, but great sensitiveness to pressure.

It would, therefore, seem important always to have a Wassermann taken in studying headaches, and if there is any evidence of any central nervous system disorder, of course, a lumbar puncture should be taken. These headaches yield gradually, but finally dramatically, to the proper anti-luetic treatment.

Nodular (rheumatic) or indurative headache is very chronic. It begins in the occiput and nape of the neck, may involve the entire head, keeps on at night, and is often worse in the recumbent position. Careful palpation discloses nodules, the size of a millet seed to that of a bean, in the subcutaneous tissue of the scalp and neck. They are very sensitive to touch, due to inclusion of sensory fibers of the fifth and occipital nerves. Local massage and heat, clearing of focal infections, iodids and analgesics, are the measures of election for relief.

2. Headaches of Toxic Origin.

Of the toxic causes of headaches the abuse of alcohol and tobacco, carbon monoxid poisoning (especially the chronic form); methyl alcohol; anilin poisoning; therapeutic use of nitroglycerin and amylnitrate, and occasionally iron and bismuth subnitrate are the most common. Some individuals are hypersensitive even to moderate use of alcohol

and tobacco, and merely sitting in a room filled with cigar smoke may cause them to have night or morning headaches. I have seen a low-grade, dull headache cease when the administration of iron by mouth for anemia was stopped. So-called intestinal toxemias with headache will be discussed with the functional headaches.

3. Headaches in the Cardiovascular-Renal Disease Groups.

These are frequent. Headaches occur in vascular hypertension, in chronic nephritis, and in chronic nephritis with hypertension. The headache is often of the same type and is fairly characteristic. It is an excruciating, dull headache, intermittent or continuous in character affecting, as a rule, the whole head, but centering in the occiput. As a rule it is occipital, and is worse in the early morning. It wears away during the day as the circulation increases with activity. It often awakens the patient in the early hours. Generally the blood pressure is high, although it may be relatively low. The ophthalmoscope discloses the usual vascular or renal retinal changes, and studies of the urine, blood chemistry, and kidney function afford the differentiation as to the type of disease present. The treatment is that of the disease determined. Usually the diet should be restricted, consisting mainly of milk, carbohydrates, vegetables, and fruit. The protein and salt intake should be determined by the blood-chemistry findings. Elimination by the bowels, kidneys, and skin should be promoted. The strength of the heart should be maintained.

In crises of hypertension, bleeding (generally 200 to 300 cubic centimeters of blood) may be helpful. Lumbar puncture may be of advantage at times to relieve headaches. The use of pyramidon, salicylates, codein, sedatives, and hypnotics should be carefully supervised and restricted, but some may be necessary. Bed rest is of the greatest importance.

While gout does not belong in this group, "gouty headaches" may be mentioned here, since there is often an associated arteriosclerosis in gout. Unexplained headaches in arthritic or other patients with tophi or joint symptoms should lead to a study of the purin metabolism. In polycythemia, headache may be the most common subjective symptom. Headache may be the chief symptom in the onset of acute nephritis, in which case urinary examination will be the principal diagnostic aid.

4. Headaches Due to Disorders of Special Senses.

See previous discussions for these.

5. Headaches Due to Organic Diseases of the Brain.

These will not be discussed here.

6. Migraine.

Migraine (bilious, sick, or periodic headaches) is inherited as a dominant unit Mendelian character. The part heredity plays is to produce a sensitized nervous system. The periodicity of attacks, the comparative well-being between them; the frequent association in women with menstruation;

the peculiar eye sensations of blurred or partial vision and scotomata; the headache which is deep in the skull, frequently hemicranial, but radiating variously to the temple, nose, and to the back of the neck, spreading all over the head; the frequent association of nausea and vomiting, and the less frequent attacks of true abdominal migraine, consisting usually of a severe cutting or boring epigastralgia, which is independent of and uninfluenced by food, and which may radiate (although it is generally limited to the epigastrium), are the chief characteristics. Even in the presence of organic pathology found on physical examination, this history should make any physician exceedingly wary of resorting to any surgical aids for treatment. These individuals are high strung, nervous, generally underpar physically, and present many other complaints. Careful analysis of their histories may indicate the need of attention to eyes, nose; functional regulation of the intestinal tract; supplying glandular needs (see below); restoring nutrition; changing environment and type of work, and perhaps, as suggested by Tom Brown, restricting either the use of carbohydrates, or proteins, or studying food allergy, as suggested by Rowe. I have been disappointed in the efficacy of any one specific form of treatment, however, and have found the general fundamental régime as described above, including the administration of calcium and mild sedatives, the most helpful. The headaches finally disappear.

7. Functional Headaches.

The headaches of functional disorder, exclusive of migraine, may vary from the dull, heavy frontal type, with a feeling of head fullness and congestion, frequently with stuffy nose and related abdominal discomfort, with colon fermentation, carbohydrate intolerance, and spastic constipation; alternating with splattery, gassy stools, to the purely neurotic type, where the headache is more a sense of pressure, diffuse in character and covers the entire skull cap, with a feeling of constriction like a band about the head. Often in these latter cases there is considerable loss of weight, undernutrition; ptosis and general nervous exhaustion, as well as reflex digestive symptoms. Such symptoms are often relieved by bed rest. The cure in the first group is obviously dietary and correction of the colon disorder; of the second, restoration of nutrition, rest, relaxation, and general reconstruction of the physical state alone will bring any improvement.

8. Endocrine Headaches.

Some women, who have been subject to migraine in early life, are very likely to suffer from headache of the menopause. The pain is dull, often frontal, but the vertex may be a prominent site. It may be constant, day and night, but usually occurs two or three times a week. It is aggravated by physical and nervous strain. Besides menopausal symptoms, there may be a mild myxedema, and a minus basal metabolic rate. Small doses of thyroid as well as ovarian substitution therapy afford great relief.

Pituitary headache may be associated with tumor or dysfunction. Distention of the pituitary capsule, aside from tumor, as in the case of a very small sella, closed in by the clinoids, may produce periodic headaches of obscure origin. Some of these lack the visual symptoms of classical migraine, and occur particularly at menstruation. We know that menstrual bleeding depends on the activity of the anterior pituitary. The headaches are usually bitemporal, frequently severe and persistent. Pituitary feeding has relieved some of these, and A. P. Thomson reports improvement of the headaches following administration of the ovarian follicular hormone which, in animals, has been shown to reduce the size of the pituitary body.

Exophthalmic goiter may give rise to migrainoid headaches.

American Medical Association Officers by States.—The May, 1934, *Journal of the Indiana State Medical Association* gives a tabulation of officers and committees of the American Medical Association over a ten-year period. It states:

Recently there has been some comment concerning the matter of state representation in the American Medical Association, and for that reason the present study was undertaken, covering a period of ten years. The results are shown in the following table:

Alabama	11	Missouri	16
Arizona	0	Montana	0
Arkansas	0	Nebraska	9
California	14	Nevada	0
Colorado	14	New Hampshire	0
Connecticut	71	New Jersey	1
Delaware	0	New Mexico	0
District of Columbia	39	New York	65
Florida	0	North Carolina	0
Georgia	11	North Dakota	0
Idaho	0	Ohio	51
Illinois	212	Oklahoma	0
Indiana	13	Oregon	13
Iowa	8	Pennsylvania	30
Kansas	8	Rhode Island	0
Kentucky	2	South Carolina	0
Louisiana	13	South Dakota	0
Maine	0	Tennessee	10
Maryland	21	Texas	8
Massachusetts	49	Utah	0
Michigan	34	Vermont	0
Minnesota	36	Virginia	7
Mississippi	0	Washington	1

Salicylates in Rheumatic Relapses.—Perry treated forty-one children suffering from rheumatic heart disease with acetylsalicylic acid. The dose was 10 grains (0.65 gram) three times a day for twelve months. The patients were seen every three or four weeks and observations were made on their symptoms, physical signs, and weight. The authors observed that the body weight is a valuable guide to the progress of these cases. Relapses of a rheumatic nature, *i. e.*, chorea, arthritis or carditis, were observed in 12.1 per cent of the treated patients as compared with 17.9 per cent of the 106 controls. The abnormal physical signs in the heart decreased or disappeared in 34 per cent of the treated cases as compared with 24.5 per cent of the controls. Of the treated cases, 12.1 per cent showed an increase in the physical signs as compared with 8.4 per cent of the controls. For all ages the average gain in weight showed no significant difference in the two groups. In regard to general health, the parents of some of the patients stated that there was an improvement, while others stated that the children were no better.—*Lancet*.

"The county nurse who works well and thinks intelligently is sure to do much more than affect the limited area in which her work lies, for she is blazing a trail that will in time become a broad highway."—Gardner.